



## Risk Mapping for Northern Kenya and Southern Ethiopia

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*We used results from 120 group interviews collected in 1998 to quantify how inhabitants across northern Kenya and southern Ethiopia perceive and rank various risks to their livelihoods. We also mapped risk patterns using Global Positioning System (GPS) coordinates. Respondents recognized 15 sources of risk overall, with the most common being reliable access to food and water. Other risks were not mentioned by a majority of respondents and reflected diversity in local situations. Country of residence, wealth class, gender, and predominant means of food production (pastoralism, agro-pastoralism, and farming) influenced risk ranking. For example, wealthy males were most concerned about resource access and livestock prices. Women and the poor were more concerned about access to health services and education and reducing conflict. Risk maps are shown to be useful tools to display patterns of conflict, drought, and related phenomena. Because local problems vary, local solutions to improve risk management will be similarly variable. Participatory approaches clarify local development priorities. Recognition that factors such as wealth and gender will strongly affect risk management priorities should lead to more appropriate and fine-tuned development initiatives.*

### Background

The main research objective of the PARIMA project is to increase our basic knowledge of various types of risk that affect indigenous populations residing in northern Kenya and southern Ethiopia. Better understanding of the complexity and intensity of risk—whether related to drought, market inefficiencies, or insecurity, for example—can improve our ability to prescribe useful interventions for pastoral development.

Our study area is split in half by the Ethio-Kenya border. Our study area is long (about 700 km from Baringo, Kenya, in the southwest to Negelle, Ethiopia, in the northeast) and large in terms of area (roughly 124,000 km<sup>2</sup>). Despite that our study area is largely “rangelands” it is variable from place to place. Climate varies from arid to semi-arid and sub-humid largely depending on elevation and landscape features.

Our study area is home to about 10 major ethnic groups. Public services are poor, poverty and hunger are widespread, and violence occurs in the form of highway robbery and livestock raiding.

We began our research program with a risk mapping exercise over six months in 1998. We expected that this work would improve our understanding of how various risks are perceived by subject populations and how patterns might be mapped out to aid in better targeting follow-up research and assistance in rural areas. A post-doctoral associate (Kevin Smith) travelled widely throughout the study area and conducted 120 group interviews. The location of each group was noted using GPS (Global Positioning System) coordinates that were transferred to maps. Groups were asked to confer and rank the most important sources of risk that affected

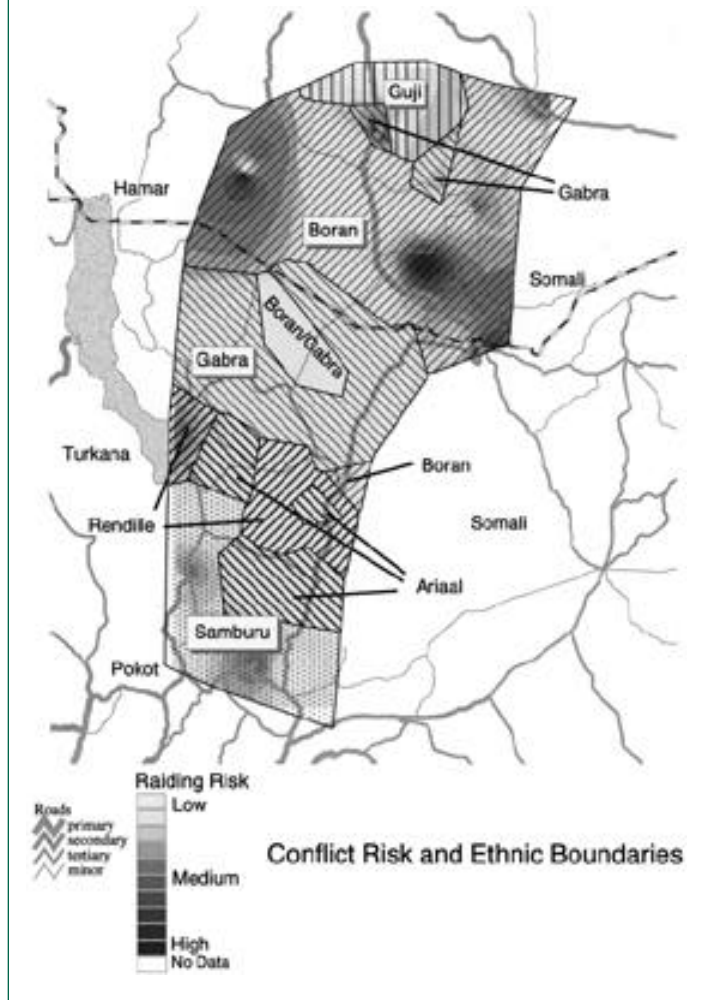
them—risk was defined as “what is worrisome” to respondents and was classified according to incidence and severity. An index was developed that united both incidence and severity—this ranged from a maximum value of 1.0 to a minimum of 0.0. Forty-nine of the respondent groups were from Ethiopia and 71 were from Kenya. Fifty-nine groups were females and 61 were males.

## Major Findings

We found that respondents recognized 15 major sources of risk. The most common worries overall—considering both incidence and severity of impacts—was lack of food and water (index values of 0.56 and 0.53, respectively). These were the only risks mentioned by a majority of sampled groups. Far behind were other risks such as challenges posed from animal disease (0.31), poor access to human health clinics (0.23), low and variable livestock prices (0.15), threats of conflict or violence (0.14), and poor access to schools (0.12). Some of these risks—like conflict, for example—were recognized as important and dangerous when they occur, but they were ranked relatively low because of infrequent occurrence.

There were also influences of country of residence, wealth, gender, and predominant means of food production. For example, compared to the Kenyans, Ethiopians reported relatively more concern about lack of food and poor access to formal education. The Kenyans, in contrast, worried relatively more about reliable access to water, exposure to violence, wildlife damage to crops, access to transport, and being able to pay school fees. Poorer people tended to worry more

*Figure 1: Perceived conflict risk in the PARIMA study area based on 120 group interviews in 1998. Ethnic boundaries were interpolated based on these results and other information.*



about the threat of human disease, ethnic conflict or banditry, and crop failure. Females tended to worry more about lack of food and conflict. Wealthier people (and males) tended to worry more about resource access and livestock prices. Compared to farmers, pastoralists and agro-pastoralists tended to have more concerns with regards to lack of food, prevalence of animal disease, and livestock prices. Farmers, in contrast, were most concerned out of the three groups with respect to reliable access to water, human health clinics, schools, and farming inputs.

Some aspects of risk were highly variable across

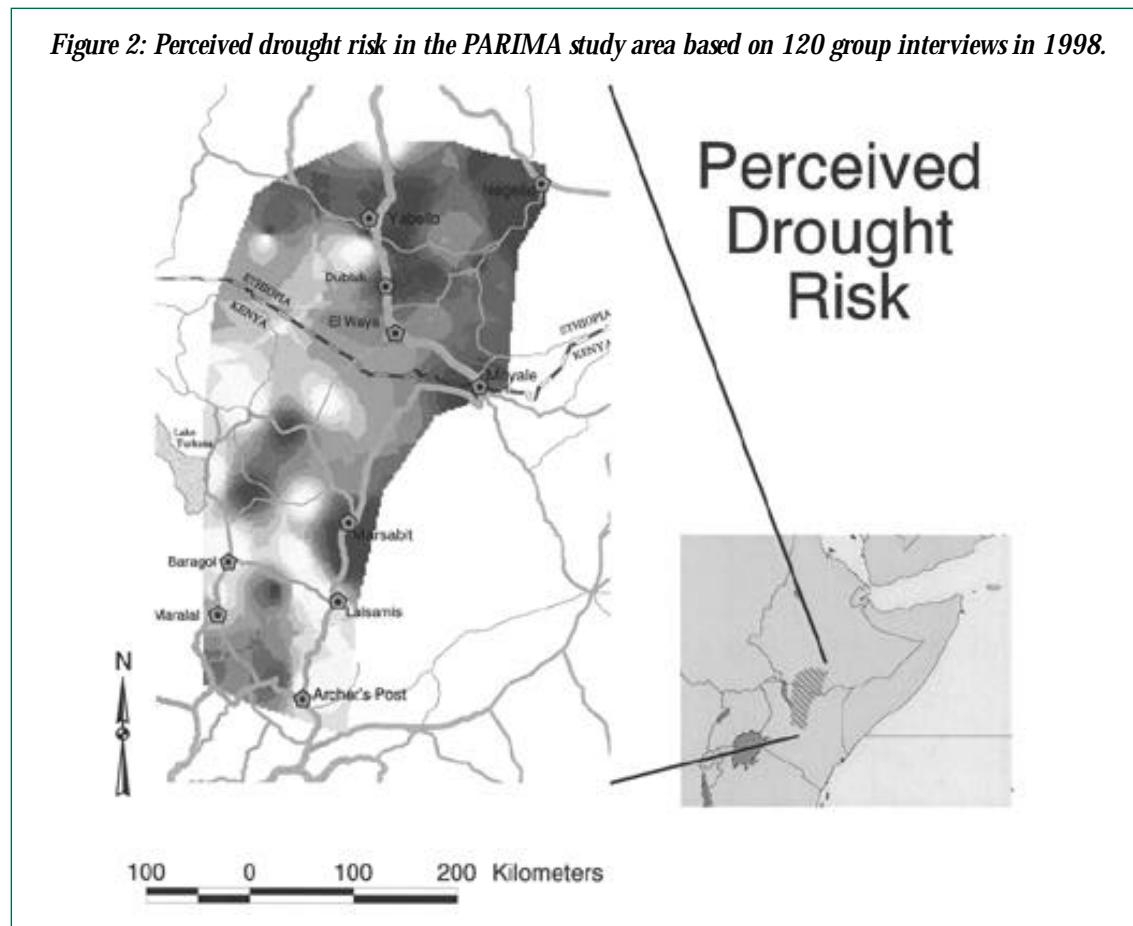
space, and this demonstrated the utility of our mapping approach. Figure 1 illustrates perceived conflict risk shaded in the map according to magnitude of the index (incidence and severity). Conflict risk clearly is magnified along certain ethnic borders. It is notable that this map is the combined output from all 120 sample groups—the conflict map for the 49 groups of females indicated a heightened fear of violence throughout the region compared to that for the males (not illustrated).

Figure 2 illustrates perceived risk of drought. The darker shades indicating greater perceived drought risk correspond to higher elevations throughout the study area, including the Borana Plateau of southern Ethiopia and Marsabit Mountain and the Samburu (Maralal) region of northern Kenya. This is somewhat ironic in that rainfall increases

with elevation, and consequently drought should be less frequent for the people who expressed greatest fears about it. The results, however, are weighted by the views of farmers and agro-pastoralists at higher elevations who are more dependent on timely rainfall for cultivation, and who are thus more easily victimized by climate-related risk.

### Practical Implications

Given the size of our study area and the diversity of local situations, we found this risk mapping approach to be useful. Our results indicate that in many cases, local priorities for risk management intervention will vary over the landscape. Therefore, local solutions for risk management problem-solving will similarly vary. Participatory approaches are useful to clarify the local initiatives



that people are most likely to strongly support. It is unlikely that one standard package of risk management interventions will be applicable to everyone. Gender, wealth status, and primary mode of food procurement affects risk management needs as well, and this should be considered in development strategies. To illustrate the potential for bias, pastoral development priorities have often

been in the realm of attempts to improve resource access and use for livestock production and enhance producer prices—priorities of wealthier males. Priorities of women and the poor—such as improved access to human health care, better schools, and conflict resolution—have often appeared less evident in broad pastoral development priorities.

## Further Reading

Smith, K., C.B. Barrett, and P.W. Box. 2000. "Participatory risk mapping for targeting research and assistance: With an example from East African pastoralists." *World Development* 28(11): 1945-59.

Smith, K., C.B. Barrett, and P.W. Box. 2001. "Not necessarily in the same boat: Heterogeneous risk assessment among East African pastoralists." *The Journal of Development Studies* 37(5): 1-30.

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The GL-CRSP Pastoral Risk Management Project (PARIMA) was established in 1997 and conducts research, training, and outreach in an effort to improve welfare of pastoral and agro-pastoral peoples with a focus on northern Kenya and southern Ethiopia. The project is led by Dr. D. Layne Coppock, Utah State University. Email contact: [lcoppock@cc.usu.edu](mailto:lcoppock@cc.usu.edu).



The Global Livestock CRSP is comprised of multidisciplinary, collaborative projects focused on human nutrition, economic growth, environment and policy related to animal agriculture and linked by a global theme of risk in a changing environment. The program is active in East Africa, Central Asia and Latin America.

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